

Application of Spatially-Distributed Watershed Models for Resource Management

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Keywords: watershed models, resource management, spatially-distributed

Agencies and industries responsible for land and water management are being required to identify those areas susceptible to various types of environmental hazard and degradation such as erosion, slope failure, sedimentation, and non-point source pollution. There is an increasing awareness that responsible land use management must involve a combination of data collection and spatial model analysis. Demands placed on models for environmental decision making have increased in recent times. For example, where it was once sufficient to model catchment outflow, it is now necessary to estimate distributed surface and subsurface flow characteristics, such as flow depth and flow velocity. The current generation of spatially distributed hydrologic and water quality models are designed to represent the effects of three-dimensional terrain on flow processes and the spatial variability of hydrologic processes without the gross, and often unrealistic, simplifications associated with previous generation conceptual models. Distributed models are also well suited to take advantage of current spatial data products (such as NEXRAD rainfall and AVHRR snowcover data), or real-time point measurements (such as Snotel air temperature, soil moisture, and snow water equivalent). This presentation provides an overview of distributed hydrologic models with example applications in resource management.